ADVANCING OZONE OPTIMIZATION DURING PRE-DESIGN, DESIGN AND OPERATION

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SUMMARY

This report focuses on ways to optimize ozonation systems used to treat water and wastewater.
Specifically, the study concentrates on minimizing operating and capital costs while maximizing benefits.

Background

Over the past two decades, the use of ozone in North America has increased by a factor of 25.
Ozone is used in the treatment of water and wastewater to enhance disinfection, to improve the color, taste, and odor of drinking water, to reduce levels of disinfection byproducts, and to help with the oxidization or removal of organics, inorganic compounds, and particles. Many ozonation systems, however, are not operating as efficiently or as effectively as they could be.

Objective

The goal of this report is to help utility representatives and their water and wastewater customers understand some of the ways they can optimize their existing or future ozone water treatment systems.

Approach

This study was conducted in three stages. The fIrst stage focused on the development of a standardized ozone evaluation protocol. The next stage examined nine existing ozone facilities in order to expand the database of information about such facilities. The second stage also looked at case study examples and strategies for achieving optimization. The final stage generalizes some of the findings from the second stage in order to produce a list of ideas for ozone system improvement.

Results

The study found potential for lowering capital cost through optimization during pre-design. Redundancy level and standby equipment were recognized as having significant impact. In addition, ozone demand and decay should influence generator and contact sizing decisions. Also, minor design modifications during the design stage can result in a 15% savings on average. The study suggests that plant administration make optimization a priority and that staff implement optimization strategies and monitor progress as well as keep meters in proper calibration and equipment in good working order.